EHS–International, Inc.

13228 NE 20th Street, Suite 100
Bellevue, Washington 989005-2049
Phone 425-455-2959
Toll Free 800-666-2959
Fax 425-646-7247

February 6, 2014

Mr. Garrett Condel
Sellen Construction
227 Westlake Avenue North
Seattle, WA 98109

Subject: **LEED EQ Cr. 3.2– Indoor Air Testing**
The Park Place Building
1200 Sixth Avenue, Seattle, Washington
EHSI Project 10605-01

Dear Mr. Condel:

At your request, EHS-International, Inc. (EHSI), an environmental health and safety consulting firm, conducted indoor air testing in support of LEED EQ Credit 3.2, (CI) on the 20th Floor of The Park Place Building located at 1200 Sixth Avenue, Seattle, Washington. Sampling was conducted on February 4, 2014. The results, conclusions and recommendations are included in the attached report.

EHSI is pleased to provide our professional industrial hygiene services. If you have any questions concerning this report or if EHSI can provide further services to you, please call me at (425) 455-2959.

Sincerely,

EHS-International, Inc.

Clinton Holzhauer, LEED AP, CMC
Manager, Indoor Air Quality Services

Floor 20
The Park Place Building
LEED EQ Credit 3.2—(CI) Air Testing Results

Floor 20 Test Area
(Photo from Pre-Test 01-22-14)
The Park Place Building
1200 Sixth Avenue, Seattle, Washington

Prepared for:

Mr. Garrett Condel
Sellen Construction
227 Westlake Avenue North
Seattle, WA 98109

February 6, 2014
EHSI Project 10605-01

EHS–International, Inc.

13228 NE 20th Street, Ste. 100
Bellevue, Washington 98005
Telephone: (425) 455–2959 ▪ Toll Free: (800) 666–2959 ▪ Fax: (425) 646-7247

EHS-International, Inc.

Indoor Air Quality Consulting & Building Investigations

13228 NE 20th Street, Ste. 100 Bellevue, WA
(425) 455-2959 • Fax (425) 646-7247
www.ehsintl.com

Results of Indoor Air Quality Testing in Park Place Building

Floor 20

1200 Sixth Avenue, Seattle, Washington
For LEED IEQ Credit c3.2

EXECUTIVE SUMMARY

EHS-International, Inc. (EHSI), an environmental health and safety consulting firm, conducted indoor air quality (IAQ) testing in the newly renovated twentieth (20th) floor of the Park Place Building, located at 1200 Sixth Avenue, Seattle, Washington, on February 4th, 2014. The purpose of the testing was to determine whether the space is in compliance with the indoor environmental quality (IEQ) standard IEQ Credit c3.2 established by the United States Green Building Council (USGBC) for LEED® for Commercial Interiors (CI) 2009.

EHSI accomplished LEED® IAQ sampling in one (1) indoor location on the 20th floor. Sampling included using hand-held instruments to directly read and data-log concentrations of carbon monoxide (CO) and airborne particulates less than 10 microns in diameter (PM10) and collecting samples for laboratory analysis of airborne concentrations of total volatile organic compounds (TVOCs), formaldehyde and 4-phenylcyclohexene (4-PCH).

Results from the sampling indicate that concentrations of CO, PM10, TVOCs, formaldehyde and 4-PCH were all less than the maximum allowable values established by LEED®.

These results indicate that the newly renovated twentieth (20th) floor in the Park Place Building has passed the Indoor Environmental Quality Tests for LEED IEQ Credit c3.2.

CONDITIONS DURING TESTING

- Renovations on floor 20 were complete at the time of the assessment.
- The floor was unoccupied at the time of testing, except for the EHSI Industrial Hygiene Technician.
- The 20th floor has a footprint of approximately 13,000 square feet and one air handling unit provides conditioned air to the space.
- The space includes open work areas around the perimeter of the floor with some interior private offices and conference rooms.
- The space was "flushed" with 100% outdoor air for approximately three days prior to IAQ testing.
- The sample was collected from 3.5 feet above floor level and sample collection took place over a four hour period.

Mr. Brain Wheeler, Systems Specialist, MacDonald-Miller Facility Solutions, provided a letter stating that the heating, ventilating and air conditioning (HVAC) system "started at the normal daily start time and operated at the minimum outside air flow rate for the occupied mode throughout the test".

TESTING SCOPE & METHODS USED

Based on the LEED® requirements of one sampling location for each 25,000 square feet, one (1) location on the 20th floor was chosen for testing. The LEED® requirements are based on square footage and the number of ventilation systems. Testing was conducted in the following location:

- Floor 20 – Open office area between work station "Clusters" 17 and 18 on the south perimeter wall near the southwest corner of the floor.

A floor plan denoting the sampling location is included in Appendix A.

EHSI tested for carbon monoxide (CO), airborne particulates less than ten microns in diameter (PM10), total volatile organic compounds (TVOCs), formaldehyde and 4-PCH.

Real time measurements were made of carbon monoxide (CO) and fine airborne particulates less than 10 microns in diameter (PM10). The measurements were obtained using a calibrated TSI Q-Trak indoor air monitor for CO and a calibrated TSI Dust-Trak for PM10. Data was logged every minute over a four-hour period. Additional information for CO is provided in Appendix B and additional information for PM10 is located in Appendix C. Calibration data for the direct read instruments used is included in Appendix D.

TVOCs and 4-PCH were sampled using thermal desorption tubes (TDTs) from PRISM Analytical Technologies, Inc. (PATI) in Mount Pleasant, Michigan. The collected samples were returned to PATI under chain-of-custody control and analyzed using gas chromatography and mass spectrometry (GC/MS). Samples were collected at a flow rate of 2.0 liter per minute (lpm) for at least 240 minutes.

Formaldehyde was sampled using a N580 Assay passive monitoring badge with both face plates removed. The monitoring badge was submitted, under chain-of-custody control, for analysis to Galson Laboratories (Galson) in East Syracuse, New York. Samples were analyzed in accordance with modified OSHA 1007 using High Performance Liquid Chromatography (HPLC) with Ultraviolet light (UV).

PATI laboratory analytical test results are included in Appendix E. Galson laboratory test results are included in Appendix F. The letter from MacDonald-Miller Facility Solutions is presented in Appendix G. Field Data sheets are presented in Appendix H.

Sampling was conducted by Mr. Rory Peterson, EHSI Industrial Hygiene Technician, on February 4th, 2014, between 8:00 am and 12:10 pm. All laboratory analytical results were expedited.

TEST FINDINGS

The results from testing, presented in micrograms per cubic meter (ug/m^3), parts per billion (ppb) or parts per million (ppm) are listed in Table 1.

Table 1
TVOCs, PM10, CO, Formaldehyde and 4-PCH
20th Floor
February 4th, 2014

Sampling Location	TVOCs (ug/m^3)	PM10 Particulates (ug/m^3)	CO (ppm)	Formaldehyde (ppb)	4-PCH (ug/m^3)
Floor 20 SW Perimeter Open Office Area	400	17	0.0	<20	<0.1
LEED Maximum Allowable	**500**	**50**	**9**	**27**	**6.5**

< = less than

CONCLUSIONS

Results from air testing on the newly renovated 20th Floor of the Park Place Building, located at 1200 Sixth Avenue, Seattle, Washington, indicate that the space had concentrations of carbon monoxide, formaldehyde, TVOCs, PM10 and 4-PCH that were below the maximum allowable concentrations established by LEED®.

These results indicate that the 20th Floor has **passed** the Indoor Environmental Quality Tests for LEED® IEQ Credit 3.2 CI.

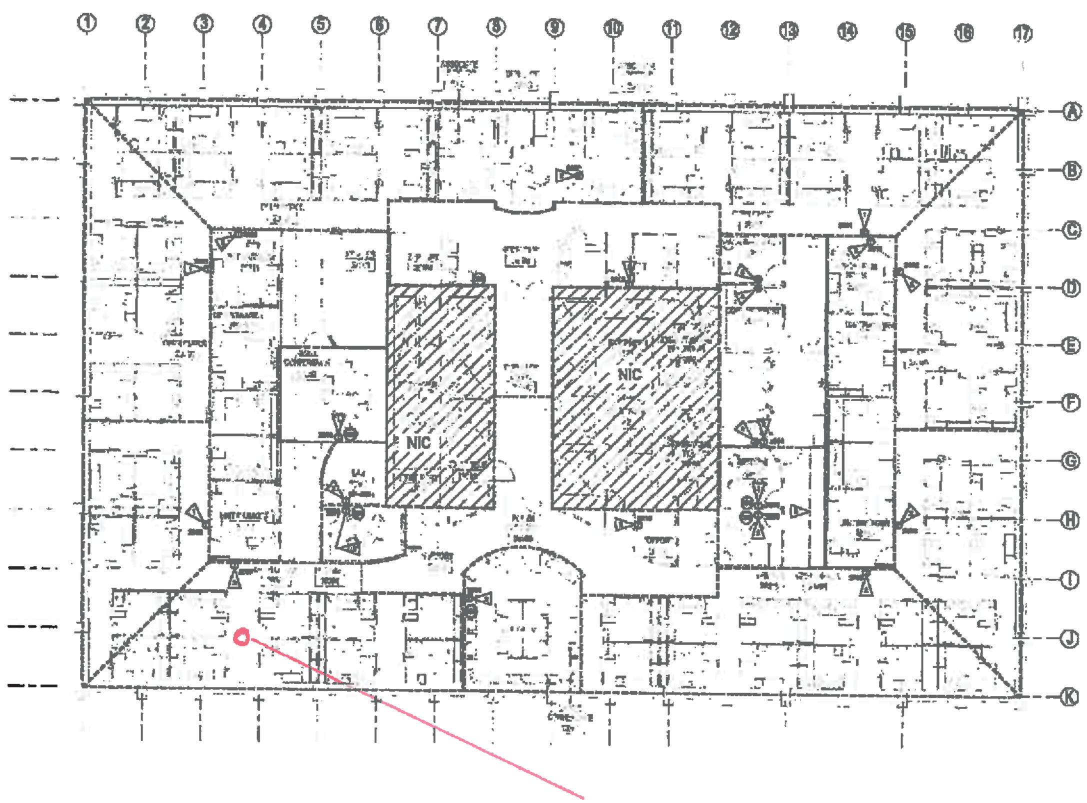
LIMITATIONS AND STANDARD OF CARE

This testing was conducted by EHS-International, Inc. in accordance with the scope of work defined by EHSI proposal 13-018 and the USGBC LEED Reference Guide, 2009 Edition. EHSI followed currently accepted industrial hygiene practices, including professional opinions based on observations and laboratory data obtained. Other than this, no warranty is implied or intended.

APPENDIX A

FLOOR PLAN WITH SAMPLING LOCATION

IAQ SAMPLING LOCATION
FLOOR 20



Pre-Test 01-22-14
Pre-Test 01-29-14
Final Test 02-04-14

SHEET NOTES:

FLAG NOTES:

EPA - REGION 10

1200 6th Ave.
Levels 10-16 & 18-21
Seattle, WA 98101

Gensler

HAROIS

EPA - REGION 10

HVAC ZONE PLAN - 20TH FLOOR

M03.20A

HVAC ZONE PLAN - 20TH FLOOR

1

APPENDIX B

CARBON MONOXIDE (CO)

The Park Place Building
Floor 20
February 4, 2014

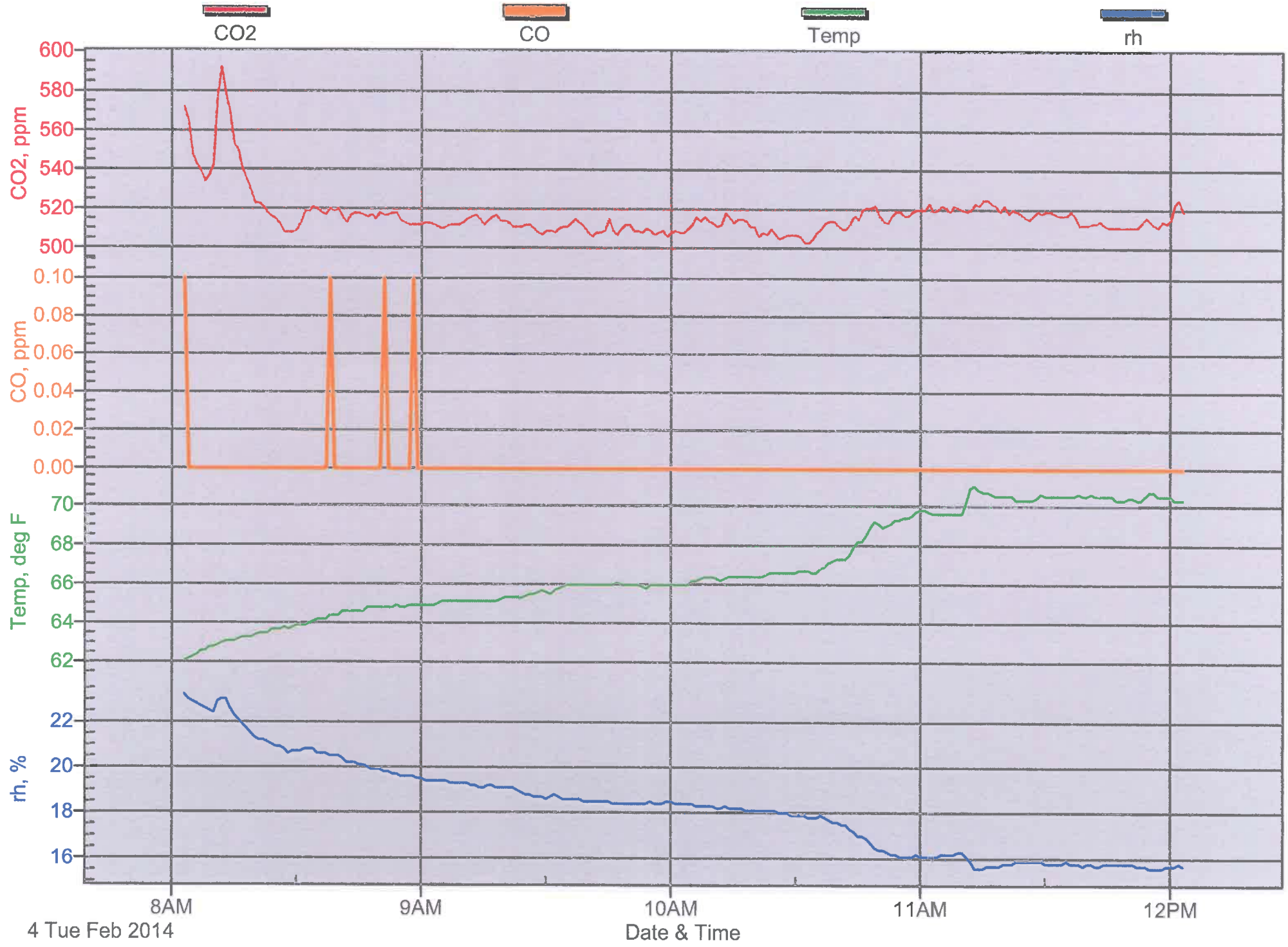
Carbon Monoxide (CO)

Instrument		Data Properties	
Model	Q-Trak Plus	Start Date	02/04/2014
Meter S/N	8554-08061026	Start Time	08:02:01
		Stop Date	02/04/2014
		Stop Time	12:03:01
-		Total Time	0:04:01:00
		Logging Interval	60 seconds

Statistics				
	CO2	CO	Temp	rh
Avg	517 ppm	0.0 ppm	66.8 deg F	18.3 %
Max	592 ppm	0.1 ppm	71.0 deg F	23.2 %
Max Date	02/04/2014	02/04/2014	02/04/2014	02/04/2014
Max Time	08:12:01	08:03:01	11:13:01	08:03:01
Min	503 ppm	0.0 ppm	62.1 deg F	15.6 %
Min Date	02/04/2014	02/04/2014	02/04/2014	02/04/2014
Min Time	10:32:01	08:04:01	08:03:01	11:13:01
TWA (8 hr)	259	0.0		
TWA Start Date	02/04/2014	02/04/2014		
TWA Start Time	08:02:01	08:02:01		
TWA End Time	12:03:01	12:03:01		

The Park Place Building - Floor 20

CO - 02-04-14



APPENDIX C

PM10 – AIRBORNE DUST

The Park Place Building
Floor 20
February 4, 2014

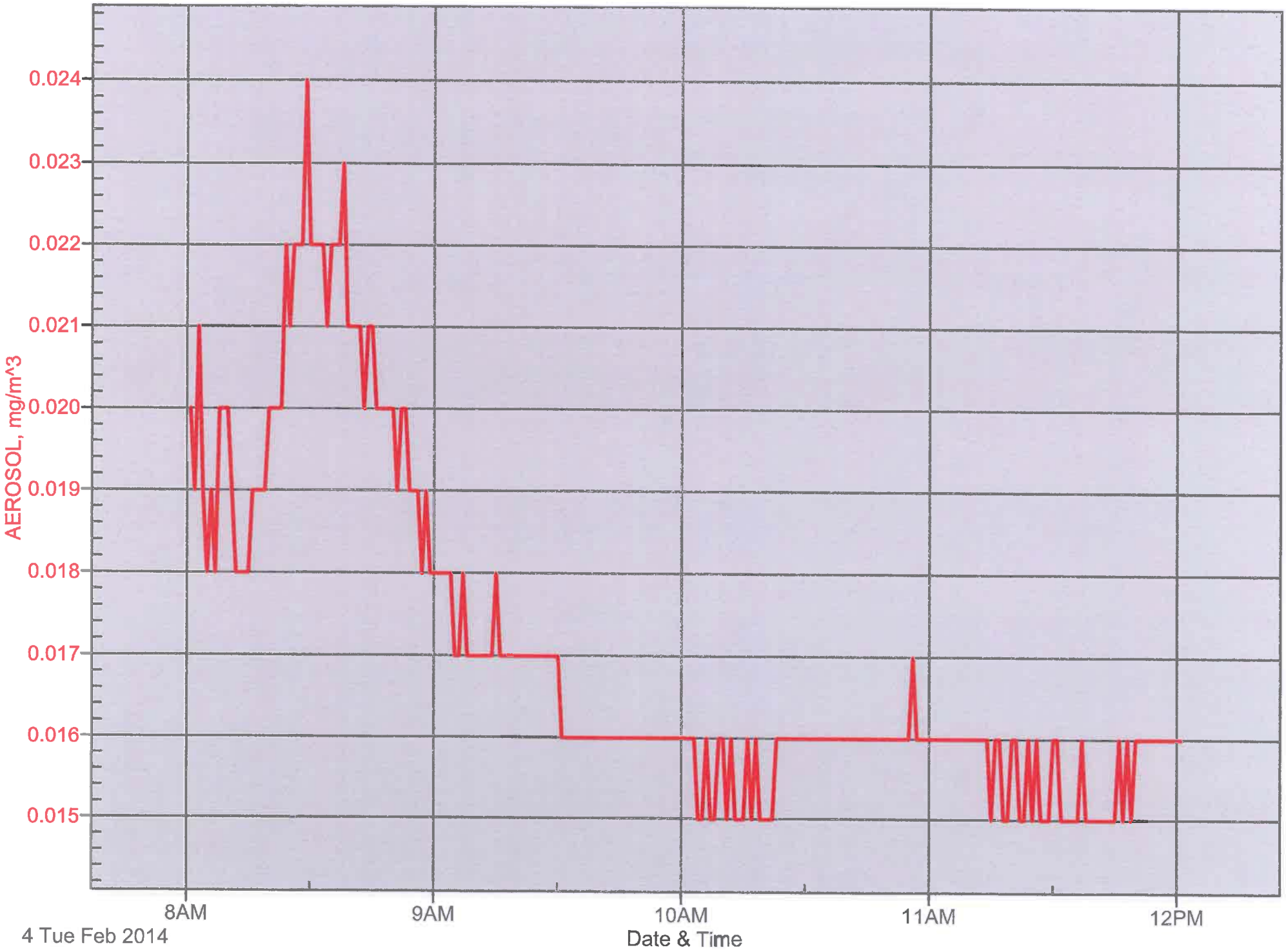
PM10

Instrument		Data Properties	
Model	DustTrak II	Start Date	02/04/2014
Instrument S/N	8530090515	Start Time	07:59:59
		Stop Date	02/04/2014
		Stop Time	12:00:59
		Total Time	0:04:01:00
		Logging Interval	60 seconds

Statistics	
	AEROSOL
Avg	0.017 mg/m^3
Max	0.024 mg/m^3
Max Date	02/04/2014
Max Time	08:28:59
Min	0.015 mg/m^3
Min Date	02/04/2014
Min Time	10:03:59
TWA (8 hr)	0.009
TWA Start Date	02/04/2014
TWA Start Time	07:59:59
TWA End Time	12:00:59

The Park Place Building - Floor 20

PM10 - 02-04-14



APPENDIX D

INSTRUMENT CALIBRATION DATA

CERTIFICATE OF CALIBRATION AND TESTING

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

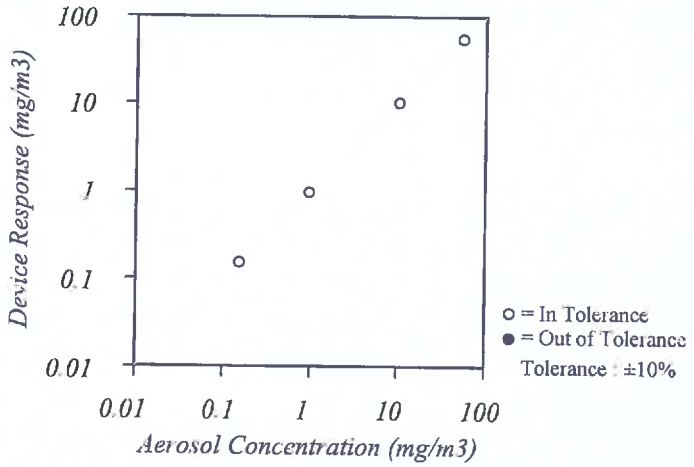
Environment Condition		
Temperature	68.5 (20.3)	°F (°C)
Relative Humidity	55	%RH
Barometric Pressure	28.54 (966.5)	inHg (hPa)

Model	**8530**
Serial Number	**8530090515**

☒ As Left ☐ As Found

☒ In Tolerance ☐ Out of Tolerance

Concentration Linearity Plot



System ID: DTII01-02

FLOW AND PRESSURE VERIFICATION — **SYSTEM DTII01-02**

Parameter	Standard	Measured	Allowable Range	Parameter	Standard	Measured	Allowable Range
Flow lpm	3.1	3.0	2.94 ~ 3.25	Pressure kPa	96.8	96.8	91.99 ~ 101.67

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass of standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1

Measurement Variable	System ID	Last Cal.	Cal. Due
Barometric Pressure	E003733	03-12-13	03-12-14
Humidity	E002873	11-08-12	11-08-13
DC Voltage	E003315	01-02-13	01-02-14
Microbalance	M001324	01-04-13	01-04-15
2.8 um PSL	580457	n/a	n/a
Pressure	E003511	11-07-12	11-07-13

Measurement Variable	System ID	Last Cal.	Cal. Due
Temperature	E002873	11-08-12	11-08-13
DC Voltage	E003314	01-02-13	01-02-14
Photometer	E003319	02-19-13	08-19-13
1 um PSL	596913	n/a	n/a
10 um PSL	39166	n/a	n/a
Flowmeter	E002006	03-05-13	03-05-14

Calibrated

May 20, 2013
Date

TSI P/N 2300157

EHS–International, Inc.

Q-TRAK Plus CALIBRATION LOG

TSI Model 8554
Serial Number 8554-08061026
Bought new by EHSI 8/2006

Date	Calibration By	CO2	CO	Temp	RH
01/20/12	HOLZHAUER	X	X	—	—
6/25/12	HOLZHAUER	X	X	—	—
12/03/12	HOLZHAUER	X	X	—	—
2/4/13	HOLZHAUER	X	X	—	—
3/4/13	HOLZHAUER	X	X	—	—
6/1/13	HOLZHAUER	X	X	—	—
7/1/13	HOLZHAUER	X	X	—	—
7/8/13	HOLZHAUER	X	X	—	—
1/2/14	HOLZHAUER	X 102%	X 9/%	—	—
1/21/14	HOLZHAUER	X	X	—	—
2/4/14	HOLZHAUER	X	X	—	—

CO/CO2 Span Gas Lot#06-3220, filled 12/21/06
CO/CO2 Zero Gas Lot#06-3150, filled 12/22/06

APPENDIX E

PATI LABORATORY ANALYTICAL RESULTS
TVOCS AND 4-PCH

PRISM Analytical Technologies

Analytical Report

Client: EHSI
13228 Northeast 20th Street Suite 100
Bellevue, WA 98005

Sampled By: R. Peterson
Project: The Park Place Bldg 10605-01
Location: Seattle, WA
-

Client Sample ID: 10605-01-20-2
Volume: 48.2 L
Date Sampled: 02/04/2014
Sample Type: TDT BB740

COC: 28904
Laboratory ID: 28904-1

Received Date: 02/05/2014
Approved Date: 02/05/2014
Scanned Date: 02/05/2014
Report Date: 02/05/2014

A2-GS Basic TDT Analysis

Compound	Sample Concentration µg/m3	Reporting Limit µg/m3	Additional Information
Total VOCs	400	200	Total volatile organic compounds calculated based on internal standard ratio. Does not include C1-C4, or methanol.

Compound	CAS	Sample Concentration µg/m3	Sample Concentration ppb	Reporting Limit µg/m3	Additional Information
4-Phenylcyclohexene, 4-PCH	4994-16-5	< 0.1	< 0.02	0.1	

These results pertain only to this sample as it was collected and to the items reported.
These results have been reviewed and approved by the Laboratory Director or authorized representative.

Alice E. Delia, Ph.D., Laboratory Director

Prism Analytical Technologies, Inc.
2625 Denison Dr.
Mt. Pleasant, MI 48858
989-772-5088

APPENDIX F

GALSON LABORATORY ANALYTICAL RESULTS FORMALDEHYDE

Mr. Clinton Holzhauer
EHS-International, Inc.
13228 NE 20th Street
Suite 100
Bellevue, WA 98005

February 05, 2014

DOH ELAP# 11626 Account# 13697 Login# L310240
AIHA # 100324

Dear Mr. Holzhauer:

Enclosed are the analytical results for the samples received by our laboratory on February 05, 2014. All test results meet the quality control requirements of AIHA and NELAC unless otherwise stated in this report. All samples on the chain of custody were received in good condition unless otherwise noted.

Results in this report are based on the sampling data provided by the client and refer only to the samples as they were received at the laboratory. Unless otherwise requested, all samples will be discarded 14 days from the date of this report, with the exception of IOMs, which will be cleaned and disposed of after seven calendar days.

Current Scopes of Accreditation can be viewed at www.galsonlabs.com in the accreditations section under the "about Galson" tab.

Please contact Heidi Fruhlinger at (888) 432-5227, if you would like any additional information regarding this report.

Thank you for using Galson Laboratories.

Sincerely,

Galson Laboratories

Mary G Unangst

Mary G. Unangst
Laboratory Director

Enclosure(s)

GALSON LABORATORIES

6601 Kirkville Road
East Syracuse, NY 13057
(315) 432-5227
FAX: (315) 437-0571
www.galsonlabs.com

LABORATORY ANALYSIS REPORT

Client : EHS-International, Inc.
Site : The Park Place Bldg
Project No. : 10605-01

Date Sampled : 04-FEB-14
Date Received : 05-FEB-14
Date Analyzed : 05-FEB-14
Report ID : 816693

Account No.: 13697
Login No. : L310240

Client ID : 10605-01-20-2F **Lab ID : L310240-1** **Time : 240 minutes**
Date Sampled : 02/04/14 **Date Analyzed : 02/05/14**

Parameter	LOQ ug	Raw ug	Total ug	Conc ug/m3	ppb
Formaldehyde	0.6	<0.6	<0.6	<20	<20

COMMENTS: Please see attached lab footnote report for any applicable footnotes.

Collection Media : Assay 580

Submitted by: BCF
Approved by : tlh
Date : 05-FEB-14 NYS DOH # : 11626
QC by: Tony D'Amico

< -Less Than	mg -Milligrams	m3 -Cubic Meters	kg -Kilograms
> -Greater Than	ug -Micrograms	l -Liters	NS -Not Specified
NA -Not Applicable	ND -Not Detected	ppm -Parts per Million	LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

GALSON LABORATORIES
6601 Kirkville Road
East Syracuse, NY 13057
(315) 432-5227
FAX: (315) 437-0571
www.galsonlabs.com

LABORATORY FOOTNOTE REPORT

Client Name : EHS-International, Inc.
Site : The Park Place Bldg
Project No. : 10605-01

Date Sampled : 04-FEB-14 Account No.: 13697
Date Received: 05-FEB-14 Login No. : L310240
Date Analyzed: 05-FEB-14

Unless otherwise noted below, all quality control results associated with the samples were within established control limits or did not impact reported results.

Unrounded results are carried through the calculations that yield the final result and the final result is rounded to the number of significant figures appropriate to the accuracy of the analytical method. Please note that results appearing in the columns preceeding the final result column may have been rounded in order to fit the report format and therefore, if carried through the calculations, may not yield an identical final result to the one reported.

The stated LOQs for each analyte represent the demonstrated LOQ concentrations prior to correction for desorption efficiency (if applicable).

Unless otherwise noted below, reported results have not been blank corrected for any field blank or method blank.

L310240 (Report ID: 816693):
SOPs: LC-SOP-4(13)
Total ug corrected for a desorption efficiency of 94%.
Formaldehyde results have been corrected for the average background found on the media: 0.1022 ug for lot #9A13.

Parameter	Method	PEL
Formaldehyde	mod. OSHA 1007; HPLC/UV	0.75 ppm (TWA)

< -Less Than	mg -Milligrams	m3 -Cubic Meters	kg -Kilograms
> -Greater Than	ug -Micrograms	l -Liters	NS -Not Specified
NA -Not Applicable	ND -Not Detected	ppm -Parts per Million	

GALSON LABORATORIES
6601 Kirkville Rd
East Syracuse, NY 13057
Tel: (315) 432-5227
888-432-LABS (5227)
Fax: (315) 437-0571
www.galsonlabs.com

☐ New Client?

Client Account No.*: _____

Report To*: Clinton Holzhauer
EHS - International, Inc.
13228 NE 20th St. Suite 100
Bellevue, WA 98005
Phone No.*: 425-455-2959
Cell No.: 425-766-5697
Email Results to: clinton H.
Email address: clintonH@ehsintl.com

Invoice To*: Shelby McClure
EHS - International, Inc.
13228 NE 20th St. Suite 100
Bellevue, WA 98005
Phone No.: (425) 455-2959
Email: shelbym@ehsintl.com
P.O. No.: 10605-01
Credit Card: ☐ Card on File ☐ Call for Credit Card Info.

R3

☐ Samples submitted using the FreePumpLoan™ Program ☐ Samples submitted using the FreeSamplingBadges™ Program

Need Results By:	(surcharge)
☐ Standard	0%
☐ 4 Business Days	35%
☐ 3 Business Days	50%
☐ 2 Business Days	75%
☒ ~~Next Day by 6pm~~	100%
☐ Next Day by Noon	150%
☒ Same Day	200%

Site Name: The Park Place Bldg Project: 10605-01 Sampled by: R. Peterson

Comments: Monitor ID No. KE 0337
Removed Both Covers
2 covers removed

List description of industry or Process/interferences present in sampling area :

State samples were collected in (e.g., NY): WA

Please indicate which OEL this data will be used for :
☐ OSHA PEL ☐ ACGIH TLV ☐ Cal OSHA
☐ MSHA ☒ Other (specify): LEED Testing

Sample Identification* (Maxmium of 20 Characters)	Date Sampled	Collection Medium	Sample Volume Sample Time Sample Area*	Sample Units*: L, ml,min,in2,cm2,ft2	Analysis Requested*	Method Reference^	Hexavalent Chromium Process (e.g., welding plating, painting, etc.)*
EXAMPLE	04/24/13	2pc UW PVC	960	L	Hexavalent Chromium (Cr6)	Mod OSHA ID-215	Welding
10605-01-20-2F	02/04/14	Assay 580 Badge	240	min.	Formaldehyde	LEED Testing	

^Galson Laboratories will subsititute our routine/preferred method if it does not match the method listed on the COC unless this box is checked: ☐ Use method(s) listed on COC

For metals analysis: if requesting an analyte with the option of a lower LOQ, please indicate if the lower LOQ is required (only available for certain analytes - see SAG) :

For crystalline silica: form(s) of silica needed must be indicated (Quartz, Cristobalite, and/or Tridymite)* :

Chain of Custody	Print Name/Signature	Date	Time		Print Name/Signature	Date	Time
Relinquished by :	Rory Peterson/ [redacted] → Fedex	02/09/14	12:54	Received by :			
Relinquished by :				Received by :	M. Krause / m. krause	2/5/14	0759

Samples received after 3pm will be considered as next day's business
* Required fields, failure to complete these fields may result in a delay in your samples being processed.

APPENDIX G

EHSI FIELD DATA SHEET(S)

EHS-International, Inc.

LEED SAMPLING FORM

Project Location: The Park Place Building
EHSI Project No: 10605-01
Technician Peterson / Holzhauer
Date 02/04/14

Location # : Floor 20 - Retest - Open office Area in SW Corner
Comments

CO :
Start 8:00 Finish 12:00 Q-Trak # EHSI 0231
Log # 1 001

Comments:

PM10 :
Start 8:00 Finish 12:00 Dust Trak # EHSI 0391
Log # 2 001

Comments:

TVOC & 4-PCH:
Sample ID: 10605-01-20-2

Start 8:03 Finish 12:03 Pump# EHSI 0708

Initial Flow (LPM): 0.20 Final Flow: 0.20 Ave. Flow: 0.20

Comments:

Formaldehyde: (Passive Badge) N 580
Sample ID: 10605-01-20-2F

Start 8:01 Finish 12:01

Comments: 9A13 - KE 0337

APPENDIX H

LETTER FROM MACDONALD-MILLER FACILITY SOLUTION REGARDING CONDITION OF HVAC DURING TESTING

MacDonald-Miller
FACILITY SOLUTIONS®

February 4, 2014

Brian Morant
Hermanson Company LLC
1221 2nd Ave N
Kent, WA 98032

Subject: IAQ Building Ventilation

Dear Brian:

This letter is to confirm that the Park Place ventilation system providing OSA to WCAC-2001 has started up on time today. The system will continue to provide minimum OSA for the duration of today's occupied schedule until 6 PM.

Regards,

Brian Wheeler
System Specialist
MacDonald-Miller Facility Solutions
206-768-4064